



Village group approach for enhanced prosperity and livelihood security through conservation of resources - An overview

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ABSTRACT

There is an incessant need to provide sustainable livelihood and gainful employment to the rural masses through developmental research, effective use of regional resources, expansion of suitable technologies and skill development. This is doable through support of community participation through Village Cluster or Group Approach, called 'VCA' or 'VGA'. Typically, a cluster is a contiguous group of 12-15 village *Panchayats* comprising of 5000 to 6000 poor families. Here, farmers in a cluster of villages are goaded to take part in holistic development for livelihood opportunities through resource conservation based on interventions involving multidisciplinary. The cluster approach has the basic elements of mutual trust building with all the stakeholders, solving common felt needs, formulation and execution of action plan through participatory approach involving all the stakeholders. Innovative approaches like contract farming, FFS and other participatory mode help farmers to enhance their income. Although additional costs may occur due to human resources and backward integration operations, yet that could be covered in long run. Therefore, village cluster approach with resource conservation has a key role in enhancing farm income and upliftment of rural masses that will in turn help enhancing overall productivity and resource use efficiency. Applications of cluster approach through resource conservation finds place in seed village, integrated pest (resistance) management, farm mechanization, higher efficiency in share of common resources (land and water) and watershed development, organic farming, precision farming, reduced cost of cultivation, increased margins through higher production efficiency, risk & uncertainty avoidance, agro-services and entrepreneurship, effective integration with other institutions (banks) for mutual benefits, logistic arrangement, capacity building and skill development. Various case studies involving village cluster approach for enhancing farm income through resource conservation such as crop revolution in Punjab, BAIF programme for sustainable development, Tamil Nadu precision farming project, Periyar PURA (Provision of urban amenities in rural areas), summer moongbean farming in Fatehpur, U.P. and Project Siruthuli (revitalizing water bodies) are discussed.

Key words: Farm income, Participatory approach, Resource conservation technology, Resource use efficiency, Village group approach

As a direct or indirect consequence of inadequate nutrition, the total number of food insecure people in the globe is probably half the population of the world (The Hindu, 2008) in addition to untimely death of approximately 18000 children daily, reports U.N. India does not come under the exception as it has over one-fifth of the world's poor. This reveals the enormous magnitude of the ferocious cycle of agriculture production systems that operate in the backdrop of rural areas which generate income for livelihood security from the scarce resources. What's more concern is the huge degradation of scarce resources such as land, water and livestock as a consequence of over-exploitation and improper technologies coupled with inadequate infrastructure to transfer appropriate technologies. These cumulatively further multiply the status of unemployment, low income, food insecurity, loss of biodiversity and above all, environmental pollution. It is in this

context, there is a pressing need to provide gainful employment through conservation of resources and their appropriate utilization for sustainable livelihood security especially for the rural poor through contemporary developmental research, to make use of local resources effectively, extension of appropriate technologies and skill development through community participation (Rafael, 2008). It is estimated that over 50% of the poor including the landless & small farmers having a land holding less than 1 acre (4000 m²) and have very limited access to irrigation, can neither maintain large herds of livestock nor are they able to earn a livelihood from agriculture or any other single activity. Therefore, it is crucial to promote a *development Programme* involving multidisciplinary for all the sections in a society through an approach commonly known as *Village Group (VGA) or Cluster Approach (VCA)*.

To answer such an approach at village level lies in the fact that a need is felt in our thinking process focusing on a concept called "*viable unit areas of development in rural space*". It is in this context that an understanding of a cluster

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of villages comes as a useful grassroots level unit for setting up and organizing rural development programmes at micro-level planning (Shamsul, 1999). It is more relevant now-a-days in the case of many agricultural crops as the commodities where farmers face uncertainty with respect to their requirement for planning materials (seed), production, productivity and finally disposal (marketing). For example, Group or Village Cluster Approach is established to be a gain to cotton farmers for getting them agriculturally sustainable and economically sound. Similarly, keeping in view the economic significance of insects and pests for example in pulses (Table 1), important decision for a control measures can be adopted.

Table 1. Economic signification of insect pest in pulse crops

Crop	Average crop Losses (%)	Yield losses (million tonnes)	Monetary loss (billion rupees)
Pigeonpea	30-50	1.11	155.4
Chickpea	7-15	0.73	109.5
Mungbean /urdbean	15-20	0.44	79.2
Other Pulses	5-10	0.21	21.0
Total Pulses		2.49	365.1

Sources: Mohapatra (2011)

Village group approach

The approach is envisaged at village level for ensuring community participation. A cluster or group is typically a contiguous group of 12-15 village *Panchayats* comprising of 5000 to 6000 poor families. Here, farmers in a cluster of villages are motivated to take part in holistic development for livelihood opportunities through multidisciplinary interventions (Baif, 2006). The approach has the common elements, like, initiating trust building with all the stakeholders, diagnostic study to identify the common felt needs/gaps in the cluster, development of a vision based action plan through participatory approach and its implementation involving all the stakeholders. A flow chart on VCA concept is given herein for its explanation in a nutshell (Fig. 1). Based on these approach, the objective usually include one or more of the focus areas like, providing assured livelihood and food security to families living in the village clusters, promoting economic sustainability through community participation & people's organization, improving community health and literacy (welfare measures) and promoting the status of women.

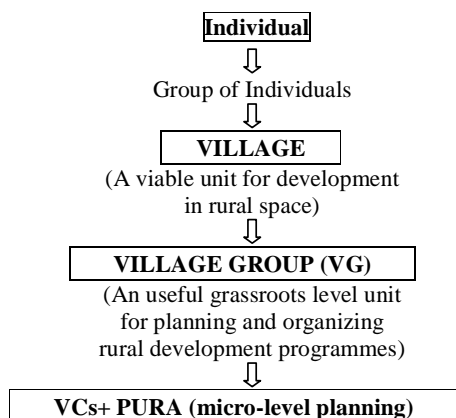


Fig 1. A flow chart on the concept of village group approach

Identifying project needs

Exploratory socio-economic surveys are needed for the identification of initial action areas consisting of one or more village clusters where project field actions for beneficiary participation are to be initiated. Such surveys are to be carried out by well-selected action-research experts on participatory lines. Hence, the village-cluster approach to be adopted in most cases implies that the project's participation activities will start in one or two selected core villages and gradually be spread to the surrounding villages. The advantages of the village-cluster approach include better handling of the guidance, coordination and supervision of the project activities, rapid spread effect of the project's impact from the pioneer villages to the adjacent ones, forming a suitable type of federation that will give them more bargaining power and a cluster enhancing economies of scale as it facilitates the provision of input supply, processing and marketing points and facilities, as well as health, education, etc. services.

Identification of poor people is a must for all-round development of the society and effective utilization of scarce resources. For the identification of the intended beneficiaries firstly available data on the rural population of the country and project area(s) are to be gathered. This could include data on population, land tenure, economic activities, income, (un- and under-) employment, housing, etc. Many of these data are required anyhow for any development project. With this information an overall direct assessment can be obtained of the numbers, proportions, etc., of the various categories of poor and non-poor farmers, fishermen and artisans etc while taking into account availability of production assets of a family, available skills in the family, on- and off-farm family income, degree of indebtedness of a family, housing conditions, nutrition, level of education for women and men, health conditions in a family, economic dependency rates within the households, lack of participation of the poor in formal and informal rural people's organizations and in local decision-making.

Most of the above data are usually available at national, and less at lower levels. Thus, identification criteria used in various participatory projects includes 1) Near landless labourers, 2) Small farmers, tenants and sharecroppers operating plots of land (1-2 hectares), 3) Small, traditional fishermen and artisans, 4) The people as under (2) and (3) who largely lack access to water, inputs, credit, markets, education, training, extension and other services (the "rural excluded"), 5) The total annual family income is below the average in the area concerned, 6) The families' main source of income is agriculture, fishing and allied activities and the family members are the principal source of labour.

Thus, the above criteria need to be specified and operationalized for each project area. Local informants and particularly the poor can be involved in participatory identification when needed, that is they may assist in applying the selection criteria and reach agreement among themselves to solve doubtful cases as to who belongs to the poor. In many

entire categories of people such as the landless, sharecroppers, small artisans, traditional fishermen, tribal and low class/caste families belong to the poor, whereas the non-poor like big and middle level farmers and fishermen, merchants, money lenders, etc. form a well-known minority that easily can be identified.

Therefore, exploratory socio-economic surveys are to be carried out by well-selected action-research experts together with on participatory lines as it is well known sought-after strategy to involve these agents as early as possible in this operation, in particular in the search for suitable village-clusters and within these core villages where the field actions will start.

Identifying low income groups

Since definition of poor rural people includes all people either living in a rural area at or below subsistence level or coming under the category of dedicated full- or part-time to agriculture, forestry, fisheries, handicrafts and/or related occupations. They may also include those who are over-dependent for work and livelihood on others with more power and means of production. Therefore, the main categories of rural poor people are: small and marginal owner-farmers, tenants, sharecroppers, landless labourers, small fishermen, forestry workers, and part of the rural artisans, of tribal people as well as of nomads and refugees. The poor village women can belong to any of these categories. Besides these, various combinations of the above categories are also frequently found to be dominant.

Therefore, most resource conservation technology (RCT) mediated participatory projects have a specific target group and attempt to benefit only or mainly the rural poor. However, given the various types of poor people and the gradations of their poverty, a project may benefit the subsistence poor and only part of the very poor and the destitute. Therefore, identification of poor people is pre-requisite for all-round development of the society and effective utilization of scarce resources. Besides data on population, land tenure, income and employment, for the sorting out of the poor the possible criteria could include availability or less of production assets of a family (types and amounts of arable land, land tenure conditions, labour, animals, equipments, tools, etc.; available skills in the family; on- and off-farm family income (including of emigrants); degree of indebtedness of a family; housing conditions; nutrition: calories intake, nutritional status of less than 5 years old child, etc.; level of education for women and men: literacy, school enrolment rates, etc.; health conditions in a family; presence of handicapped dependents, incidence of diseases, etc.; economic dependency rates within the households and lack of participation of the poor in formal and informal rural people's organizations and in local decision-making. Since most of the above data are usually available at national, and less at lower levels, therefore, identification criteria used in various participatory projects includes near landless labourers; small farmers, tenants and sharecroppers operating land area of 1-2 hectares and small, traditional fishermen and artisans besides people belonging to other economically

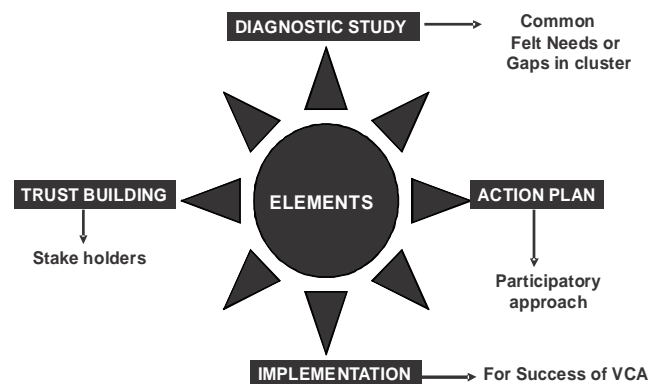
weaker backgrounds. Hence, the above criteria need to be specified and operationalized for each project area. Established Practice also shows that in various projects, the application of adequate selection criteria for project areas and in particular for specific target populations is sometimes neglected or incomplete mainly due to insufficient information on the basic concepts and methods of participatory rural development; political pressures to include certain categories of better-off people; failure to distinguish between zonal and individual/family poverty; the desire of project and supporting/donor staff to see quick results; and the pertinent influence of local leaders in the selection of project areas and target groups.

Meeting need and aspirations of intended beneficiaries

To obtain the active participation of the people in project preparation and implementation, current need-assessment is most essential. For this purpose, area and beneficiary needs are to be distinguished. *Area needs* are related to area poverty encompassing the needs of an entire territory and of all its inhabitants. Here, more and/or better physical resources, trained manpower, economic and social infrastructure, services and facilities. For meeting such needs an area-wide or "all rural people" development approach is required. To the contrary, *beneficiary needs* are directly related to group and family level poverty. They can be divided into physiological considerations such as food, clothing, housing, health; psychological needs such as safety and self-realization; economic requirements such as employment and income; and socio-cultural needs satisfying group belonging, education, recreation and social recognition. Mostly needs have a certain hierarchy that is some are for bare survival, some for sustained and other for dignified human survival. *Beneficiary needs* are interrelated with one another and also with certain area needs. Apart from needs, people also have aspirations and expectations which may, however, not coincide with their needs as perceived by outsiders. The rural poor are in general quite able to bring up the nature and priority order of their felt needs and desires.

Therefore, needs identification, or the search for ways to satisfy intended beneficiary needs, form part of an on-going participatory process and can be done more systematically

Elements in cluster approach in agriculture



and effectively when groups and organizations involved in a project bring up their felt needs, among other to perform gainful activities, whereas the delivery staff hopefully endeavours to meet these necessities. Group Promoters are to be trained to help the disadvantaged people to understand their own situations, to win their confidence by closely working with them and getting the poor to articulate their needs. The Group Promoters will also learn to stimulate the delivery staff to help meet these necessities. The basic elements of a typical cluster approach in the context of enhanced prosperity and livelihood security through participatory approach are shown herein as under:

Village group activities

In the outset, the extension personnel interact with the local community to identify the local problems without any pre-conceived ideas/activities. The community is then encouraged to interact closely and organize the participant families into 3-4 economic categories based on their income and access to various resources. Mostly families that are homogeneous on socio-economic status interact regularly to identify resources and opportunities for individual families belonging to different categories to earn the livelihood. Thus, while the marginally poor and small farmers get smaller support through 3-4 developmental interventions, the poorest families having limited resources are participating in several activities and thus, the chance of failure is less. Moreover, it enables in maintaining transparency and promotes harmony among the members although major challenges encountered in the programme is related to finding an appropriate long term solution (Adrian, 2002) for farmers requiring a suitable off-farm production and service activities such as cottage industry, hire-service and civil construction etc. for them (Silvestre, 2006).

Applications of VGA

Some of the typical resource conservation mediated VGA applications are observed and evident worldwide. Thus, it is now pertinent to highlight them in brief following their importance in resource conservation and enhancing livelihood securities of rural masses. These include a) *Seed village*: A concept operational worldwide for production of good quality seed in crops in respect of seed multiplication, maintenance of varietal integrity and seed certification, b) *Integrated Pest (Resistance) Management*: Here mostly strategies are required for prevention/control of new and emerging pests through surveillance, prevention of carry over, control of alternate hosts, spraying only at ETLs and biological control, control of existing major pests and diseases (A typical example on crops is given in Table 2 and 3), management of transgenic crop (maintenance of filler/border crop) etc., c) Wider application of farm mechanization through use of tractors (prime mover providing the pulling power for various implements), chisel plough, heavy machineries like combine harvester etc. where the main emphasis on reducing the labour costs, d) Efficiency in share of common resources (especially land & water) and watershed development, e) Organic farming- a possible solution against

contamination of food chain and environment through eutrophication and NO₃ leaching, f) Large scale adoption of precision farming through use of modern gadgets in precision Farming like GIS, Remote sensors, GPS system and computers, g) Community approach in reducing cost of cultivation due to collective procurement of agri-inputs directly from manufacturers, h) Realizing increased margins through higher production efficiency which is possible to promote an Agro-Service to deal with inputs required by cluster of villages making the farmers agri-entrepreneurs from the level of agriculturists. The collective marketing effort increased the bargaining power of the farmer group, i) Avoiding risk & uncertainty is possible through market intelligence and cooperative effort, j) Agro-service dealing in agro-inputs for use in own farm cluster at reduced price from Manufacturers, k) Integration with other institutions (banks) is a need for finance and management of crop, l) Logistic arrangement involving storage, transport, handling and delivery are also facilitated through VGA, m) Capacity building of farmers, farm workers and farm women for production technologies, fertigation, optimal crop protection practices and record maintenance, and n) Development of organizational skill so as to maintain the cohesiveness of group oriented towards overall social welfare of the community.

Table 2. Major insect pests of pulses and their distribution (Mohapatra, 2011)

Crop	Key pest	Distribution*
Pigeonpea early and medium	<i>Maruca vitrata</i> , <i>Helicoverpa armigera</i> , <i>Melanagromyza obtuse</i> , <i>Mylabris pustulata</i> , Lampeds (<i>Exelastis atomosa</i>), bruchids	Pigeonpea growing areas NEPZ, NWPZ, CZ
Pigeonpea late	<i>H. armigera</i> , <i>M. obtuse</i> , pod bugs, <i>Mylabris pustulata</i> , bruchids	Pigeonpea growing areas NEPZ, NWPZ, CZ, SZ
Chickpea	<i>H. armigera</i> , <i>Agrotis ipsilon</i> , semilooper, termite, bruchids	Chickpea growing areas NEPZ (Water-logged areas) NWPZ (drier areas), CZ, SZ
Mungbean/ Urdbean	Stemfly, whitefly, aphids, bug, jassids, pod borer, thrips, flea beetle, bruchids	All zones
Lentil	Aphid and pod borers, bruchids	NEPZ and CZ
Pea and French bean	Stem fly, leaf miner and pod borer, bruchids	NEPZ, NWPZ and CZ
bean	Stem fly and whitefly, bruchids	NEPZ and NHZ

*NEPZ: North east plain, NWPZ: North west plain, CZ: Central, SZ: South and NHZ: North hill zone

Potential outputs of VGA

The major output in terms of livelihood security and community welfare is all-round prosperity through increased productivity in diverse activities through actual community participation. The overall benefit is conservation of both manmade and natural resources and increase in farm income through in most cases both a) *Livelihood security* involving 1) Access to technology, information and market, 2) Increase in productivity of crops, livestock etc, 3) Increase in productivity of natural resources, 4) Access to micro-finance, banking and critical inputs, 5) Safe disposals through market intelligence, agro-service centres, post production facilities including value

Table 3. Major disease problems of pulse crops in India (Mohapatra, 2011)

Crop	Disease	Causal Pathogen	Problem areas of India	Extent of Damage (%)
Chickpea	Wilt/root rots	<i>Fusarium oxysporum</i> f.sp. <i>ciceri</i> ,	NEPZ, CZ, SZ	20-25
	Grey mould	<i>Rhizoctonia</i> spp., <i>Fusarium</i> spp.	Tarai – UP	10
	Ascochyta blight	<i>Botrytis cinerea</i> <i>Ascochyta rabiel</i>	Tal-Bihar NWPZ	10
Pigeonpea	Wilt	<i>Fusarium adum</i>	NEPZ, CZ, SZ	15
	Sterility mosaic	Virus	NEPZ, SZ	15
	Phytophthora blight	<i>Phytophthora drechsleri</i> f.sp. <i>cajani</i>	NEPZ, NWPZ	25
	Alternaria blight	<i>Alternaria alternate</i>	NEPZ (post rainy)	15
Mungbean and urdbean	Yellow mosaic	<i>Mungbean yellow mosaic virus</i>	NEPZ, NWPZ	15-20
	Cercospora leaf Spot	<i>Cercospora cruenta</i> and <i>C. canescens</i>	SZ (Rabi), NEPZ (Kharif)	15-25
	Powdery mildew	<i>Erysiphe polygoni</i>	CZ (Kharif) SZ (Rabi)	15-25
Fieldpea	Powdery mildew	<i>Erysiphe pisi</i>	All Zones	15-20
	Rust	<i>Uromyces viciae fabae</i> Syn. <i>U. fabae</i>	NEPZ	15
Lentil	Rust	<i>Uromyces viciae fabae</i>	NEPZ	20-25
	Wilt/root rot	Syn. <i>U. fabae</i> <i>F. oxysporum</i> f.sp. <i>lentis</i> , <i>Rhizoctonia</i> spp.	NEPZ, CZ	15
Rajmash	Bean common	<i>Bean common mosaic virus</i>	NEPZ (rabi)	Up to 30
	Mosaic	<i>Rhizoctonia</i> spp. <i>Fusarium</i> spp.	NEPZ (rabi), NHZ	-
	Root rots			

condition and 6) New employment opportunities through micro-enterprises and development of entrepreneurs/ small scale agro-industries and/or b) *Community welfares* concerning 1) Availability of safe drinking water, 2) Drainage and sanitation facilities for better health of human beings and animals, 3) Health care and Free of vices, 4) Literacy, gender equity and higher social values, and 5) Access to community/organizational services & good governance in participatory mode.

Thus, the overall impact of such programmes will be capacity improvement for improved livelihood opportunities and self governance. The target oriented impacts mostly include a) Motivation to development through identifying and use the resources efficiently, b) Substantial increase in agricultural produce, boosting income through Best Management Practices (BMPs), c) Formation of Self-Help Groups (with participation of women), d) Awareness to technical skill development for undertaking specialized skilled activities, e) Improvement in milk/meat yielding herds through appropriate animal care and hygiene, f) Increased awareness for soil & water conservation practices, efficient use of water and reclamation of degraded lands for agri-horti-forestry & mixed farming systems having year round employment potential and long term sustainability, g) Generation and continuation of additional off-farm employment opportunities year round and h) Post-production processing and market facilities for agri- & dairy produce for value addition.

CASE STUDIES UNDER VGA

Group approach in cotton cultivation

Cluster approach in cotton cultivation was initiated by M/s Appachi Company (for both ginners and buyers). This approach is an example of successful interface among the cotton producers and the financiers, input and insurance companies. The programme started during 2002-03 involving 219 cultivators (280 hectares) from 8 villages in Coimbatore

district of Tamil Nadu. By this approach, the growers enjoyed quality seeds, fertilizers and chemicals at a discount of 15-20% due to bulk purchases. The remunerative price, quality inputs available at reduced cost, assured purchase, accessibility to market information and access to quality technical counseling contribute to increase in seed cotton yield by 200%. The price received was remunerative and was more by 7.8% with increase in net return by ` 3850 ha⁻¹.

Precision farming in cotton

Implemented at Dharamapuri (Agaram Village cluster) and Krishnagiri Districts of Tamil Nadu in an area of 100 hectares (2004-05), precision farming in cotton is another example of VGA with involvement of 11 precision farmers' associations. The approach resulted in increased cotton production by 40-60% along with 15-20% reduction of cost of cultivation due to collective procurement of inputs. There was an increase of 25-30% in weightage of high quality produce per unit volume and above 50 % first grade produce (*vis-à-vis* a conventional produce) realized through this innovative group farming. Besides there was a capacity building of farmers, farm workers and women for production technologies, fertigation, optimal crop protection measures and maintenance of record.

Value chain for cotton fibre, seed and stalks - NAIP, ICAR

Initiated by NAIP ICAR, proven interventions in cotton cultivation were taken up in cluster of villages in & around Coimbatore, Salem, Erode, Perambalur districts besides select areas in Nagpur (Maharashtra) and Sirsa (Haryana) during Jan 2008 to June, 2012 at an outlay of ` 90 million. The technology back up involves Best Management Practices (BMPs) and value-addition to cotton besides enhanced cotton yield, higher profits to farmers and reduced dependence on costly external inputs.

Crop revolution in Punjab through village cluster adoption programme

It was a good example of successful VGA as introduction of the Programme during 2003-04 in cotton belt of Malwa, Punjab covering 50 villages (by 2006-07 benefiting 5266 farmers in 17330 hectares) by the Vardhaman-led consortium of spinning mills of northern India (1,9000-million Ludhiana-based textile group) and banks with the cooperation of PAU, Ludhiana led to increased cotton yield to 965 kg lint/ha (The Tribune, 2007). This substantial increase in yield was 22% higher over the world average of 790 kg lint/ha. It was possible through ICM, IPM, clean cotton picking and hands on training (Gurumurthy, 2004 and Gurumurthy, 2006). The Vardhman model of contract farming followed in the *Nava Pind* village involved 121 cotton farmers with a total cotton area of 496 ha. The crop management awareness programmes were disseminated in these field schools with the help of the Punjab Agricultural University scientists and the Punjab State Agriculture Department. The programme highlighted the importance of ICM, IPM and clean cotton picking besides the hands-on training at cotton research stations. The presentation stated that the average *kapas* cotton yield in the adopted village during the season went up to 60 maunds (2000 kg of linted cotton) per hectare as against the previous year's yield of 29 maund (958 kg of lint/ha). The other benefit included lowering down of crop expenditure incurred by the farms to ` 17,780 ha⁻¹ against ` 18,990. Satisfied with the performance, the cotton village adoption programme of Vardhman for 2004-05 was also extended to 10 villages (in two clusters) in Batinda district (around Maur cotton belt) and Ferozpur (around Abohar) district covering around 14,000 ha from a meager 500 ha.

Technology transfer by BAIF

Another milestone achieved in sustainable development through technology transfer was by BAIF Development Research Foundation (M.H.). With the active support of European Union and NABARD, the Foundation initiated a technology transfer programme to cover 33000 poor families spread over 217 villages in 11 village clusters in U.P., Rajasthan, Gujarat, M.H. and Karnataka for over 8 years (1996-2004). It was observed that 85 % of the BPL families participated came out of the poverty and enhanced their income by 50-80 %. Food security & access to safe drinking water was also ensured to all families (Baif, 2006).

Cotton IPM at village level

IPM in cotton was tried in 28 villages for about 30 years in Ganganaikenepalayam, Kaliannanapur, Vellamadai, Singanallur, Ondipudur, Annur Ramanathapuram etc. (during 1975-2005) under Coimbatore district of Tamil Nadu. The results revealed that adoption of IPM helped to manage the major pests of cotton with reduced sprays (by 58 %) and plant protection cost (` 5960 to ` 2080/ha) over non-adopted (control) villages. Besides, seed yield, net profit and BCR were increased substantially (by 15.9%, ` 9475/ha and 0.6 respectively).

Provision of Urban Amenities in Rural Areas

Large-scale employment generation and creation of number of entrepreneurs with the active support of 850 self-help groups was the result of the programme initiated in a cluster of over 60 villages (population of over 3 lakhs) near Vallam, Thanjavur district of Tamil Nadu (Periyar) where 80 hectares of waste land has been developed into a cultivable land with innovative water management schemes (contour ponds and water sheds). This model has emanated independent of any government initiative and is a good example of VGA through participatory mode.

Summer mungbean programme in Fatehpur

It is a model seed system implemented by Indian Institute of Pulses Research, Kanpur and sponsored by ISOPOM. It has started in the year 2006-10 in Fatehpur District of Uttar Pradesh, India. The main focus of this programme is to produce quality seed of chickpea and pigeonpea in the background of traditional rice-wheat cropping system. Latest introduction of *Meha* and *Samrat* mungbean genotypes has resulted in realization of net profit of ` 1000/- per day for a period of 60 days (of crop duration). Besides this, there is an increase of yield, net profit and BCR following adoption of modern practices including containing of insects pests in many pulses through viable IPM approach (Table 4). Thus, the technology expanded to an area of 150 hectares in Malwan block of Fatehpur District in U.P. Development of infrastructure like tube well was also included in the cluster of villages (IIPR, 2010).

Similarly, farmers' participatory seed production adopted by villagers for enhanced pulses production in Kanpur Dehat and Fatehpur district during 2006-10 indicated food security of these farmers in terms of pulses production following

Table 4. Effect of improved IPM on pests' population through possible intercropping

Agro-ecosystem	Insect pest	Pertinent effect on pests population
Pigeonpea + paddy	Pod borer	Incidence reduced than sole crop of pigeonpea
Pigeonpea + urdbean	<i>Madurasia obscurella</i>	Suppression of pest
Cowpea + maize	<i>Maruca vitrata</i>	Increased
Pigeonpea + pearl millet	<i>Helicoverpa armigera</i>	More damage
Cowpea + <i>Sorghum</i>	<i>Ophiomyia phaseoli</i>	Pests' population reduced and higher yields
Pigeonpea + <i>Sorghum</i> , mungbean and groundnut	<i>Empoasca Kerri</i>	Highest reduction
Cowpea + maize, pepper cassava	<i>Aphis craccivora</i> , <i>Mylabris sp.</i>	Reduction of pests
Pigeonpea + coriander	<i>H. armigera</i>	Low incidence
Short and medium duration pigeon + sorghum or castor	Many insect pests including pod borers	Low incidence than sole crop of pigeonpea

Adopted from Chaudhary (2011)

improvement in the strategic seed replacement ratio (Singh, 2011) from 2.2-11% to a moderate level of 10-20% (2.2% in chickpea to 11% in pigeonpea). Both Fatehpur and Kanpur Dehat districts farmers were benefitted from such an institute (IIPR) - adopted seed production programmes meant for pulses (chickpea and pigeonpea, Singh, 2011). The farmers were also keen to participate in participatory varietal selection trials- a scientific approach in modern seed production chain.

Alternative farming practices for remunerative dryland crops

Introduction of alternate dry land crop (in place of traditional crop) is another example for resource conserved village co-operative effort in raising both farm income and employment. It is more evident where soil erosion and land degradation is severe. Although soil erosion is a natural phenomenon attributed to geographical reasons and geographical factors, yet human intervention, heavy livestock population and developmental activities have strongly aggravated soil erosion as several estimates present alarming situation (Table 5). It was observed that alternate farming practices could be a boon for remunerative dry land crops.

Table 5. Effect of soil erosion on estimated soil loss in NW Himalaya, India and World

Area	Soil Loss	Remarks (increase/decrease from rate of soil formation)
North west Himalaya	35 million t/yr	Higher than normal rate of formation
India	5.3 billion t/yr 16 t/ha/yr	>5 times rate of formation
World	36 billion t/yr	2.6 times natural rate of formation

Adopted from Srivastava (2011)

Project siruthuli – Revitalizing water body

This is an initiative started for Coimbatoreans in Tamil Nadu by the people themselves. This ecological project aims to bring back the glory of Coimbatore and its rich heritage. The project is represented by people from all walks of life and professionally organized. The primary focus is on large scale rain water harvesting, afforestation, sewage/waste water treatment and solid waste management. Five out of nine primary tanks have already standardized in Coimbatore for large scale rainwater harvesting. Over 600 saplings have been planted on the bunds of the de-silted tanks and are being maintained. Plan is also mooted for moving towards a higher target of planting 15 lakh trees. The comprehensive study has indicated outlet of the city sewage as 10 million liters day⁻¹. A pilot plant is being taken up for sewage treatment to treat one million liters per day. The treated water will be sold to the agriculturists and industrialists as a revenue earning measure. The garbage and debris to the extent of over 26,000 cubic meters in one of the city's largest tank have been removed. This model is a bright example for revitalizing our water bodies which can be replicated throughout the country both in the rural and urban areas.

Farmers' club by NABARD

Farmers' Clubs are grass root level informal forums and

are an appropriate and most suitable strategy initiated by NABARD in late 1982 for development in rural areas through credit, technology transfer (Chatterjee and Ireyes, 1981), awareness and capacity building. Such Clubs are organized by rural branches of banks with the support and financial assistance of NABARD for the mutual benefit of the banks concerned and rural people. The broad functions of the Farmers' Clubs included the followings. 1) to coordinate with banks to ensure credit flow among its members and forge better bank borrower relationship, 2) Organize minimum one meeting per month and depending upon the need, there would be 2-3 meetings per month. Non-members can also be invited to attend the meetings, 3) Interface with subject matter specialists in the various fields of agriculture and allied activities etc., extension personnel of Agriculture Universities, Development Departments and other related agencies for technical knowhow up gradation. For guest lectures, even experienced farmers who are non members from the village/ neighbouring villages could be invited, 4) Liaison with Corporate input suppliers to purchase bulk inputs on behalf of members, 5) Organize/facilitate joint activities like value addition, processing, collective farm produce marketing, etc.; for the benefit of members. They can also sponsor / organize SHGs, 6) Undertake socio-economic developmental activities like community works, education, health, environment and natural resource management etc and 7) Market rural produce and products.

Therefore, the village cluster approach was highly successful for generation and sustenance of income of the agricultural growers especially through conservation of resources. Most of these cases involve innovative approaches like contract farming, FFS and other participatory mode that help farmers to enhance their income. For instance, Super Spinning Mills, Apache cotton and Royal Classic Mills have successfully developed backward integration with the farmers Group for supply of farm produce. Although this would create additional costs due to human resources and backward integration operation, yet it could be covered in long run. To make self-employment programmes more effective in the twelve Five Year Plan, there will be a shift in strategy from an individual beneficiary approach to a group and/or cluster approach under the Integrated Rural Development Programme (IRDP). This will facilitate higher investment levels to ensure project viability. In addition, this approach will include skills development of the poor through an inbuilt training component, upgrading of technology, establishment of forward and backward linkages, availability of appropriate infrastructure, and market tie ups. A new initiative for social mobilization will be implemented during the Plan period to create self-managed institutions for the poor. A mechanism for training social animators to assist the poor to articulate their needs and aspirations, and form their own organizations will also be implemented.

Consortium for sustainable village-based development - Village earth

It is outside India and publicly supported by non-profit, non-governmental organization (NGO) based in Fort Collins, Colorado (Albertson and Shinn, 1993; Carrol, 1992; Teigland *et*

al., 2005). The organization works for the empowerment of rural and indigenous communities around the world with active projects with the Oglala Lakota on the Pine Ridge Indian Reservation in South Dakota, the Shipibo-Konibo of the Amazon region of Peru, India, Cambodia and Guatemala (Grant *et al.*, 2003; Solvell, 2009; Solvell *et al.*, 2003). It is associated with the International Institute for Sustainable Development at Colorado State University. The Village Earth (Faulkner *et al.*, 1986) includes a sustainable livelihoods approach that recognizes the multi-layered and interrelated survival strategies of rural families (Anonymous, 1983; Edwin, 2000) and communities and seeks to build on assets and eliminate underlying constraints through an ongoing process of participatory reflection and action (Teigland and Lindquist, 2007). It also includes the clustering and networking of local institutions to promote regional self-reliance without compromising local autonomy (Silvestre and Dalcol, 2009). The development of multi-sector service centers to link local institutions to local, regional, and global resources is also its one of goals.

India's former President, Dr APJ Abdul Kalam Laments "whenever the users, knowledge and skill possessors and implementers are linked and networked, success comes effectively and multiplies". A networked resource is a means for faster development. To increase the country's GDP growth to 10%, we need such innovative steps. Clusters are a striking and common feature in today's economy as it aids in conservation and judicious utilization of scarce resources. An understanding of clusters adds an important dimension to the more commonly debated role of personal contact networks in the success of entrepreneurial farming. This will enable increase in livelihood and farm income of rural masses/farmers through resource conservation. Thus, from the foregoing, it is convincingly realized that there is an urgent need to provide gainful employment and sustainable livelihood especially for the rural poor through developmental research, effective use of local resources and their conservation, extension of appropriate technologies and skill development. This is possible through promotion of community participation through *Village Group or Cluster Approach*.

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